

CHAPTER 2

DESCRIPTION OF THE GUNTERSVILLE LAKE WATERSHED

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2.1. BACKGROUND. Guntersville Reservoir is located in northeast Alabama and southeast Tennessee, extending 76 miles up the Tennessee River into Tennessee. The nearby town of Guntersville is named for John Gunter, an early Scottish settler and adopted member of the Cherokee tribe, who established the town the year after the American Revolution. The Tennessee Valley Authority (TVA) established the stairway of dams and locks that turned the Tennessee into a 652-mile-long river highway. Guntersville Lake construction began in 1935 primarily for flood control and for the production of hydroelectric power.

This Chapter describes the location and characteristics of the Tennessee portion of the Guntersville Lake Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Tennessee portion of the Guntersville Lake Watershed is located in southeast Tennessee and includes parts of Franklin, Grundy, and Marion Counties.

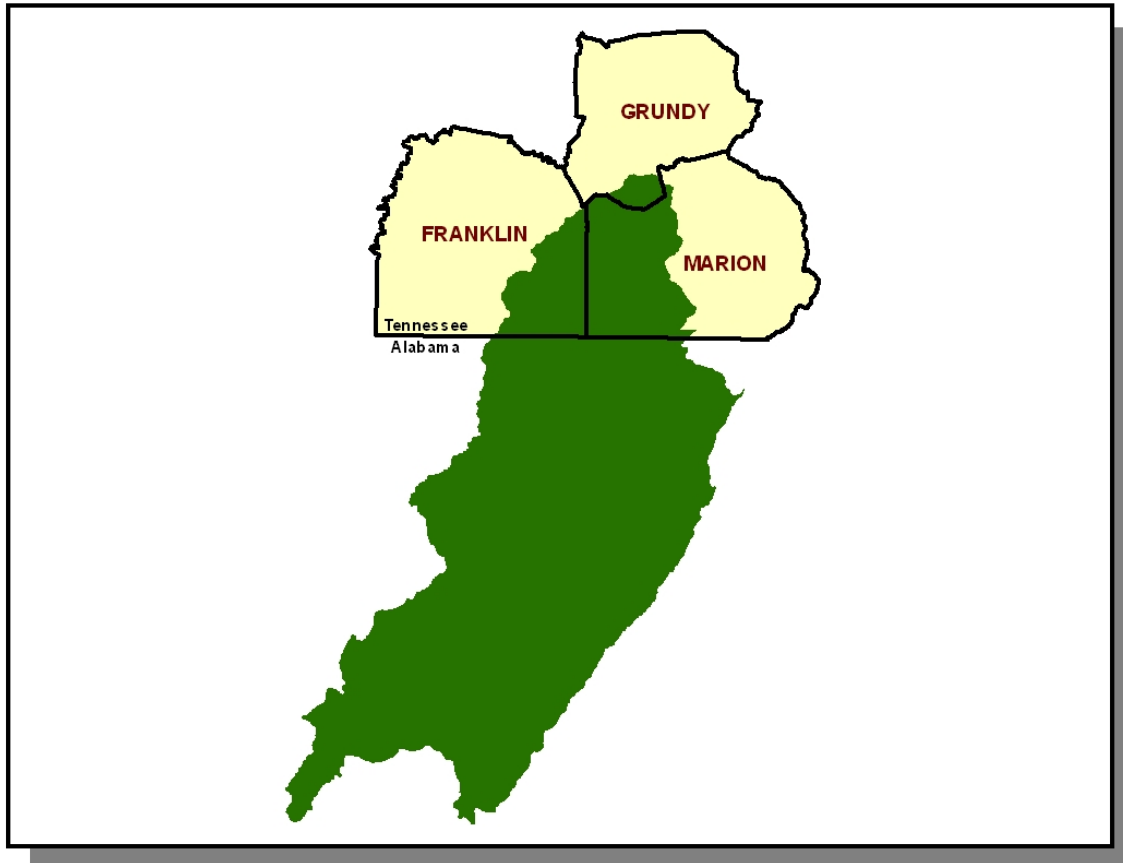


Figure 2-1. General Location of the Guntersville Lake Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Marion	60.51
Franklin	33.04
Grundy	6.45

Table 2-1. The Tennessee Portion of the Guntersville Lake Watershed Includes Parts of Three Middle and East Tennessee Counties.

2.2.B. Population Density Centers. One interstate and seven highways serve the major communities in the Tennessee portion of the Guntersville Lake Watershed.

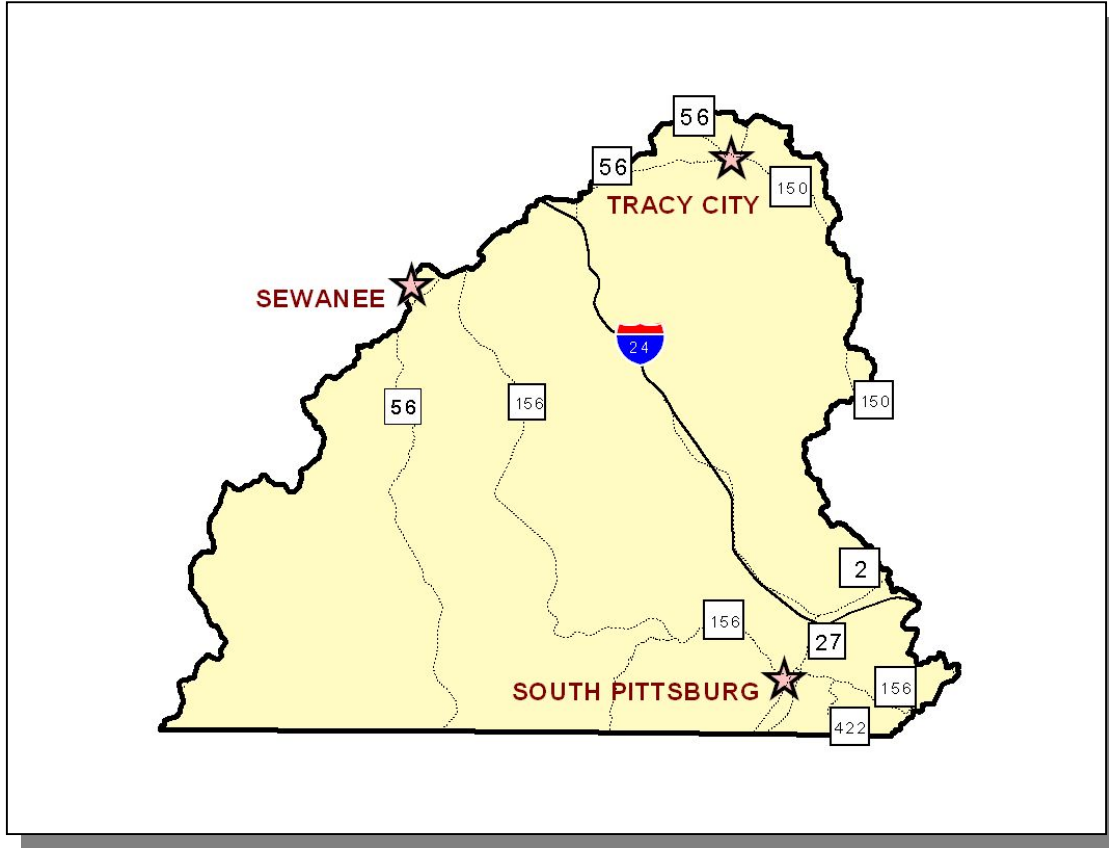


Figure 2-2. Communities and Roads in the Tennessee Portion of the Guntersville Lake Watershed.

MUNICIPALITY	POPULATION	COUNTY
South Pittsburg	3,295	Marion
Sewanee	2,361	Franklin
Tracy City	1,679	Grundy

Table 2-2. Municipalities in the Tennessee Portion of the Guntersville Lake Watershed. Population based on 2000 census (Tennessee Blue Book) or <http://www.hometownlocator.com>.

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Tennessee portion of the Guntersville Lake Watershed, designated 06030001 by the USGS, is approximately 1,983 square miles (337 square miles in Tennessee) and drains to the Tennessee River.

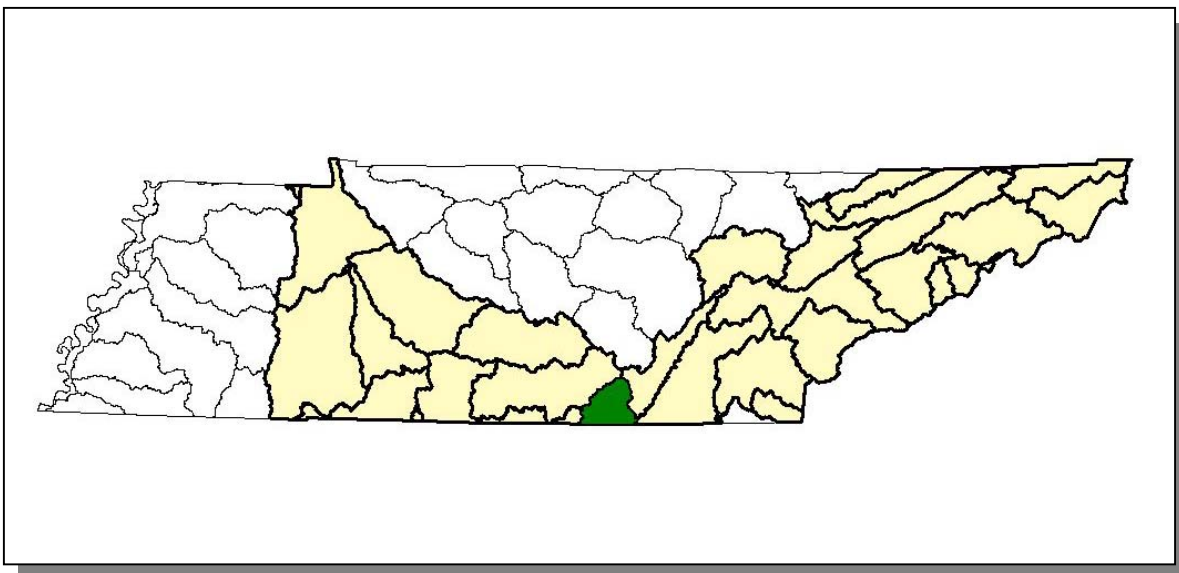


Figure 2-3. The Guntersville Lake Watershed is Part of the Tennessee River Basin.

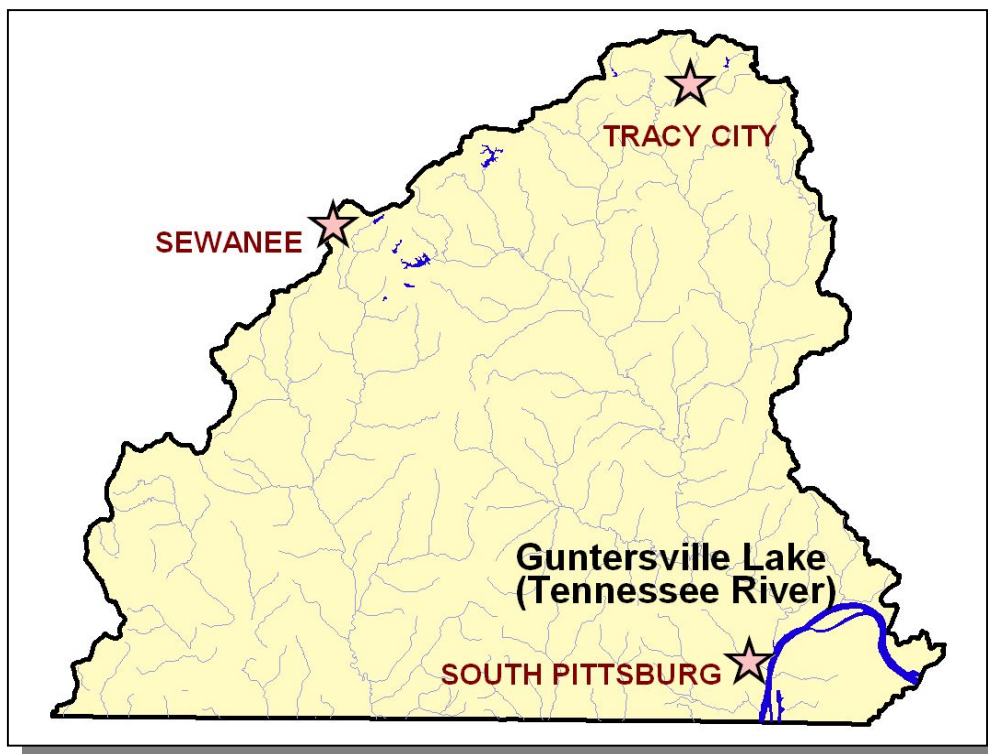


Figure 2-4. Hydrology in the Tennessee Portion of the Guntersville Lake Watershed. There are 424.3 stream miles and 1,479 lake acres recorded in River Reach File 3 in the Tennessee Portion of the Guntersville Lake Watershed. Location of the Tennessee River and the cities of Sewanee, South Pittsburg, and Tracy City are shown for reference.

2.3.B. Dams. There are 25 dams inventoried by TDEC Division of Water Supply in the Tennessee portion of the Guntersville Lake Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

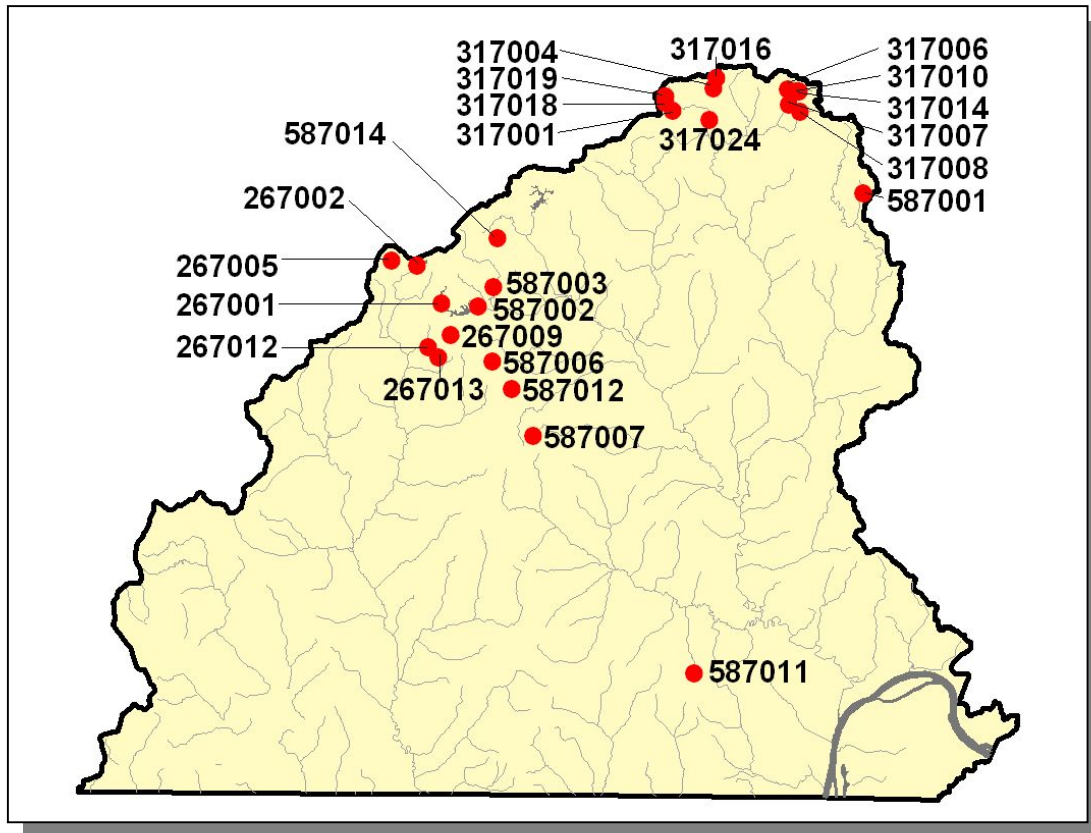


Figure 2-5. Location of Inventoried Dams in the Tennessee portion of the Guntersville Lake Watershed. More information, including identification of inventoried dams labeled, is provided in Appendix II and at <http://gwidc.memphis.edu/website/dams/viewer.htm>.

2.4. LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 2001 Multi-Resolution Land Cover (MRLC) satellite imagery.

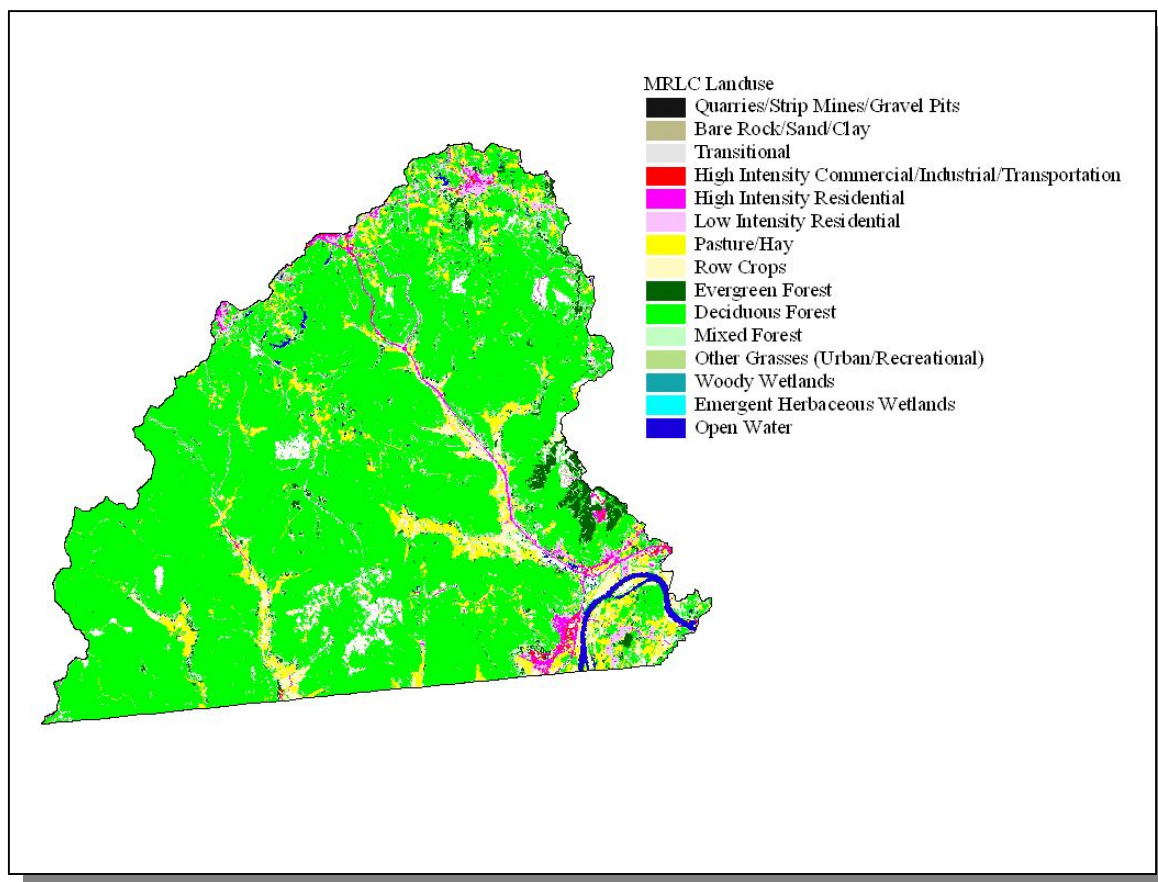


Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

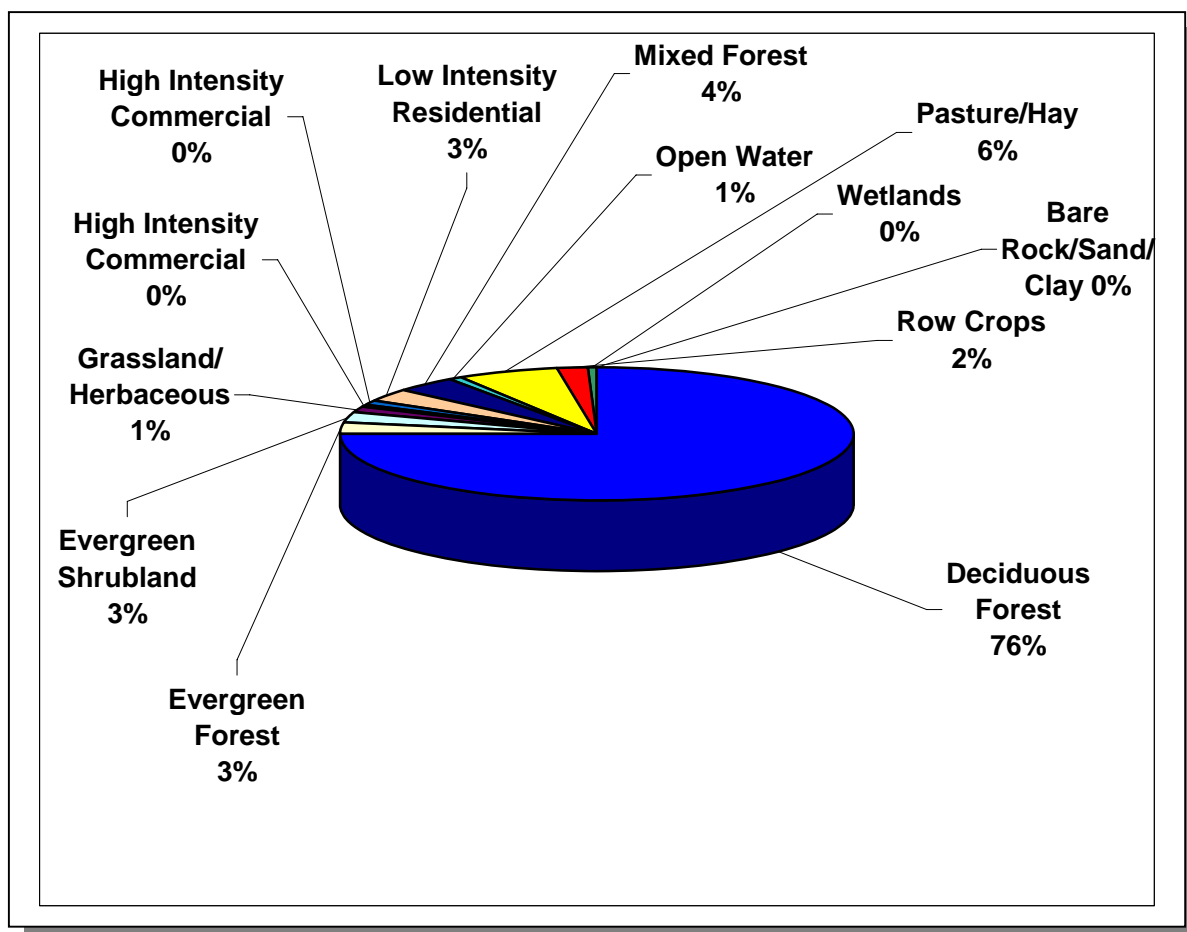


Figure 2-7. Land Use Distribution in the Tennessee portion of the Guntersville Lake Watershed. More information is provided in Appendix II.

Sinkholes, springs, disappearing streams and caves characterize karst topography. The term “karst” describes a distinctive landform that indicates dissolution of underlying soluble rocks by surface water or ground water. Although commonly associated with limestone and dolomite (carbonate rocks), other highly soluble rocks such as gypsum and rock salt can be sculpted into karst terrain. In karst areas, the ground water flows through solution-enlarged channels, bedding planes and microfractures within the rock. The characteristic landforms of karst regions are: closed depressions of various size and arrangement; disrupted surface drainage; and caves and underground drainage systems. The term “karst” is named after a famous region in the former country of Yugoslavia.

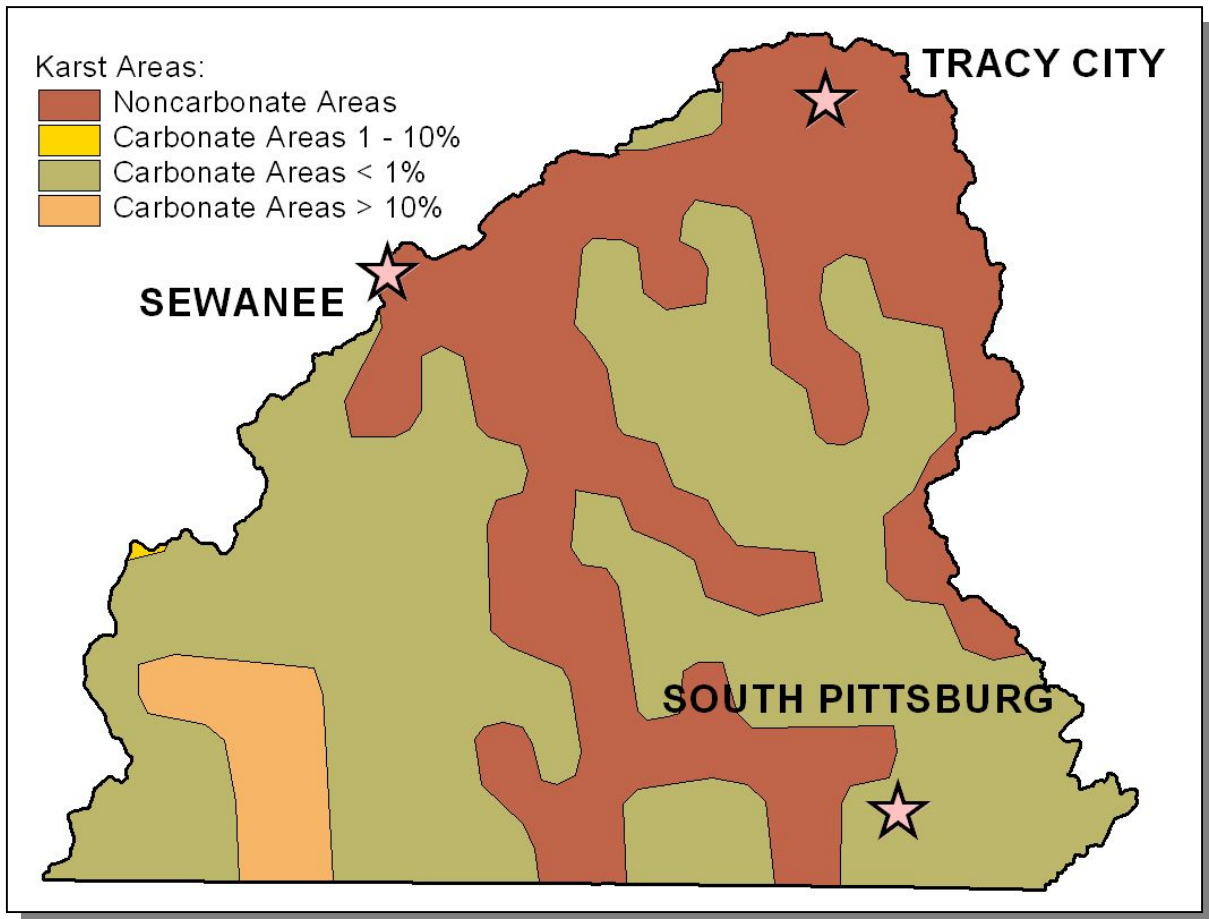


Figure 2-8. Illustration of Karst Areas in the Tennessee Portion of the Guntersville Lake Watershed. Locations of communities in the watershed are shown for reference.

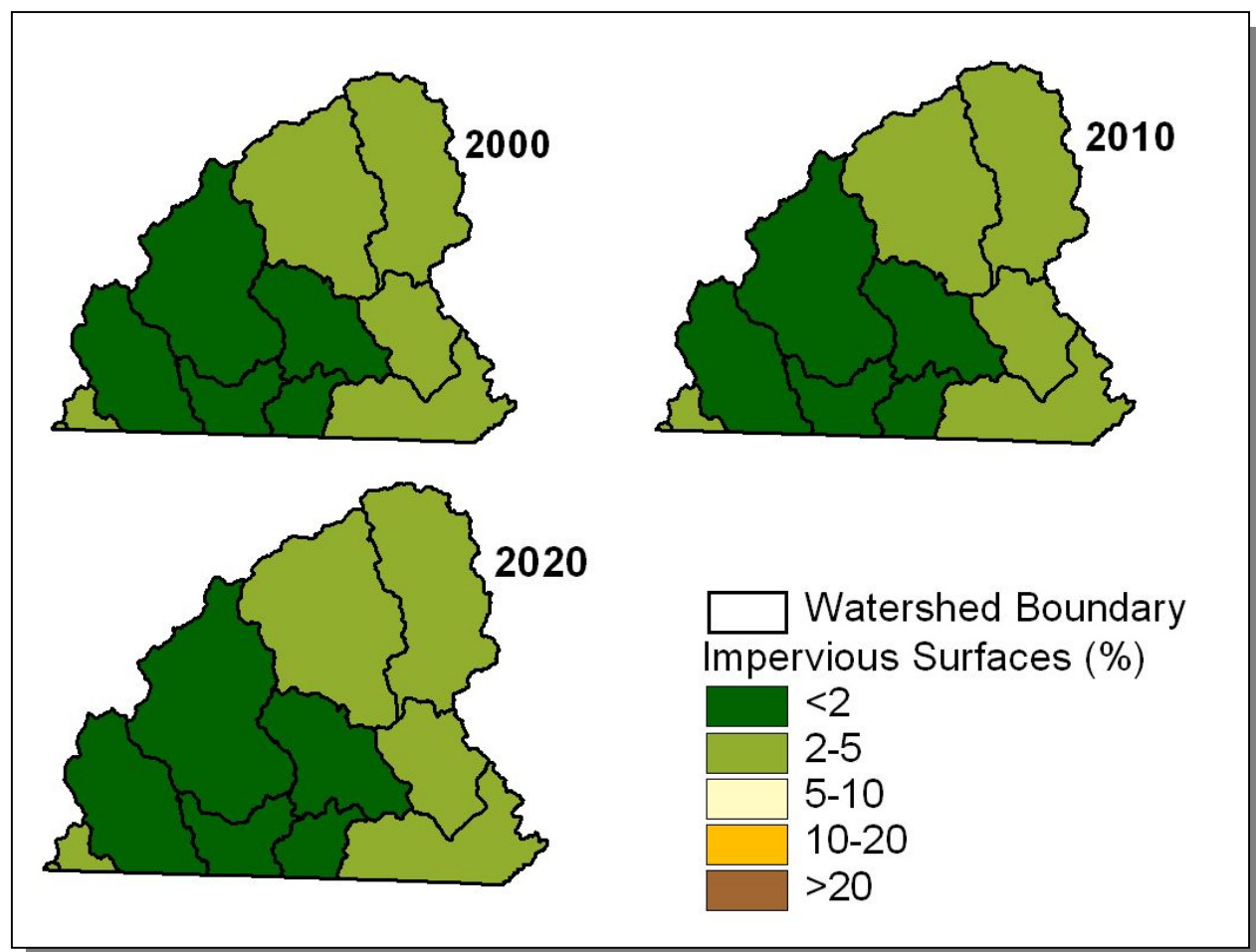


Figure 2-9. Illustration of Total Impervious Area in the Tennessee Portion of the Guntersville Lake Watershed. All HUC-12 subwatersheds are shown. Current and projected total impervious cover is provided by EPA Region 4. More information can be found at: <http://www.epa.gov/ATHENS/research/impervious/>

2.5. ECOREGIONS AND REFERENCE STREAMS. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Tennessee Portion of the Guntersville Lake Watershed lies within 1 Level III ecoregion (Southwestern Appalachians) and contains 3 Level IV subecoregions:

- The **Cumberland Plateau's (68a)** tablelands and open low mountains are about 1000 feet higher than to the west, and receive slightly more precipitation with cooler annual temperatures than the surrounding lower-elevation ecoregions. The plateau surface is less dissected with lower relief compared to the Cumberland Mountains or the Plateau Escarpment (68c). Elevations are generally 1200-2000 feet, with the Crab Orchard Mountains reaching over 3000 feet. Pennsylvania-age conglomerate, sandstone, siltstone, and shale is covered by mostly well-drained, acidic soils of low fertility. The region is forested, with some agriculture and coal mining activities.
- The **Sequatchie Valley (68b)** is structurally associated with an anticline, where erosion of broken rock to the south of the Crab Orchard Mountains scooped out the linear valley. The open, rolling valley floor, 600-1000 feet in elevation, is generally 1000 feet below the top of the Cumberland Plateau. A low, central chert ridge separates the west and east valleys of Mississippian to Ordovician-age limestones, dolomites, and shales. Similar to parts of the Ridge and Valley (^&), this is an agriculturally productive region, with areas of pasture, hay, soybeans, small grain, corn, and tobacco.
- The **Plateau Escarpment (68c)** is characterized by steep, forested slopes and high velocity, high gradient streams. Local relief is often 1000 feet or more. The geologic strata include Mississippian-age limestone, sandstone, shale, and siltstone, and Pennsylvania-age shale, siltstone, sandstone, and conglomerate. Streams have cut down into the limestone, but the gorge talus slopes are composed of colluvium with huge angular, slabby blocks of sandstone. Vegetation community types in the ravines and gorges include mixed oak and chestnut oak on the upper slopes, more mesic forests on the middle and lower slopes (beech-tulip poplar, sugar maple-basswood-ash-buckeye), with hemlock along rocky streamsides and river birch along floodplain terraces.

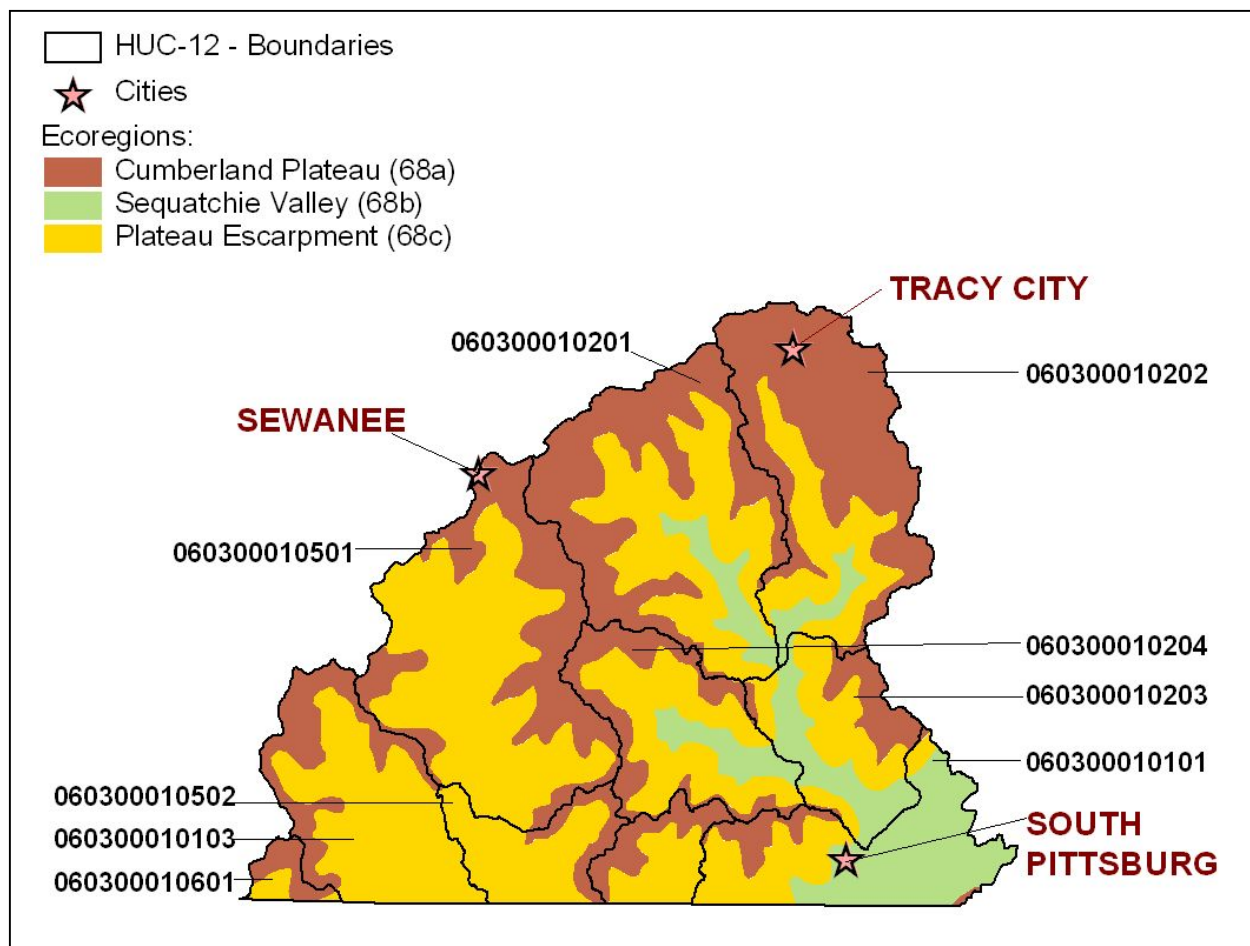


Figure 2-10. Level IV Ecoregions in the Tennessee Portion of the Guntersville Lake Watershed. HUC-12 subwatershed boundaries and locations of Tracy City, Sewanee, and South Pittsburg are shown for reference.

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

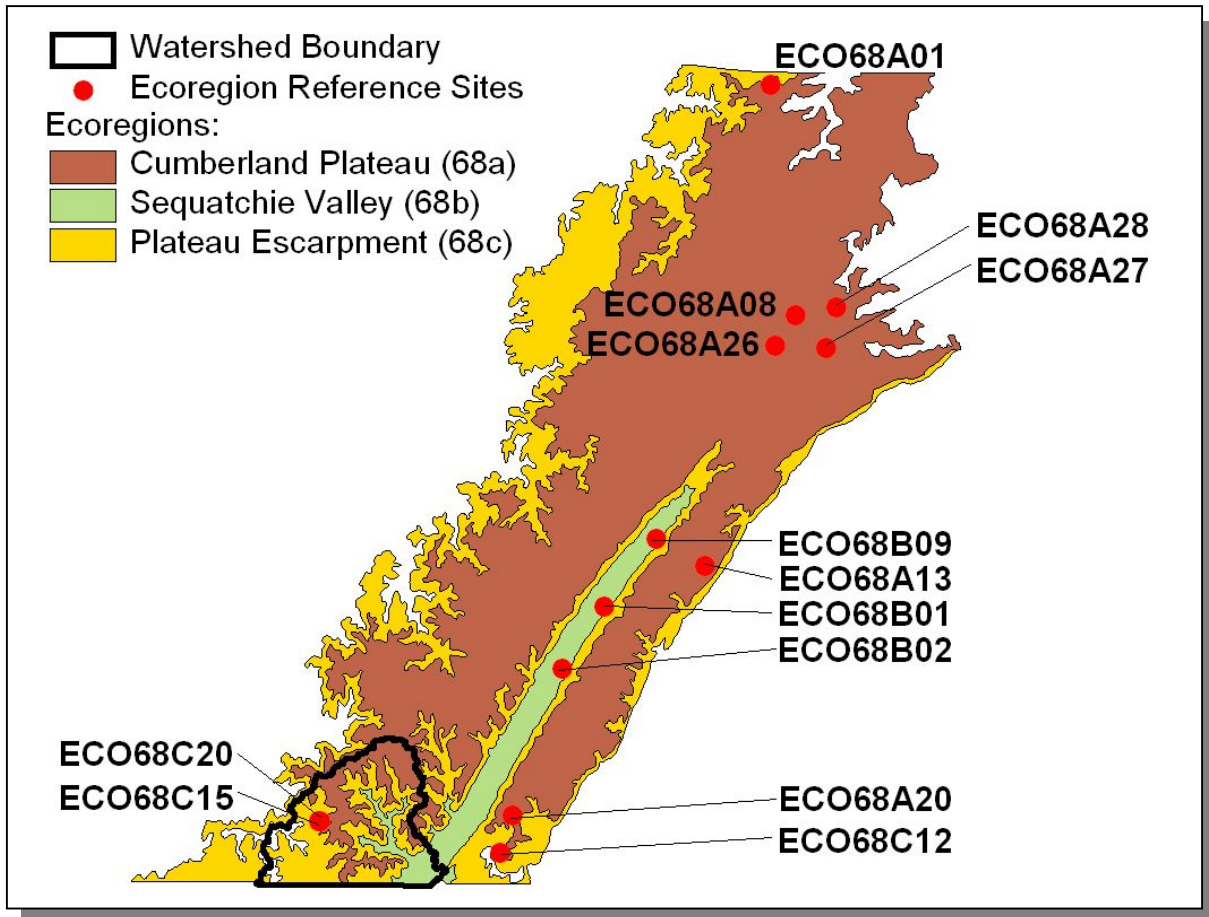


Figure 2-11. Ecoregion Monitoring Sites in Level IV Ecoregions 68a, 68b, and 68c. The Tennessee Portion of the Guntersville Lake Watershed is shown for reference. More information, including which ecoregion reference sites were inactive or dropped prior to 06/01/2006, is provided in Appendix II.

2.6. NATURAL RESOURCES.

2.6.A. Designated State Natural Area. The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. TDEC/Division of Natural Areas administers the State Natural Areas program. Further information may be found at <http://www.state.tn.us/environment/na/>.

The Tennessee Portion of the Guntersville Lake Watershed has three Designated State Natural Areas:

The Mr. and Mrs. Harry Lee Carter Natural Area is a 375-acre natural area located in Franklin County that is part of the South Cumberland Recreation Area. Named after the couple that donated the land to the state, this natural area protects part of a large solution valley associated with the karst erosional processes characteristic of the Cumberland Plateau escarpment. A significant cave system extends from Lost Cove to the head of Crow Creek. The stream systems draining into Lost Cove disappear into the Lost Cove Cave at the Big Sinks and travel underground for over a mile, emerging at the main entrance of Buggytop Cave. This impressive cave entrance is 100 feet wide and 80 feet high. Peter Cave is the other main cave entrance. There have been considerable archeological artifacts of the Woodland and Mississippian period excavated from the entrance. The artifacts are on display at University of the South in Savannah, Tenn.

Natural Bridge is a three-acre natural area located in Franklin County. Natural Bridge is a 25-foot high natural sandstone arch with a span of 50 feet that provides a scenic overlook of Lost Cove. There is a wet weather spring associated with a rock house located behind the natural bridge. The spring probably contributed to the formation of the arch. Lost Cove is a large karst formation on the dissected section of the Cumberland Plateau. It is essentially a giant sinkhole. Lost Creek flows into the valley and disappears into Lost Cove Cave at the Big Sinks and re-emerges as Crow Creek from Buggytop Cave within Mr. & Mrs. Harry Lee Carter State Natural Area. The site also has been referred to as Sewanee Natural Bridge, as the University of the South in Sewanee once owned it. The natural area is a part of the South Cumberland Recreation Area.

Grundy Forest is a 234-acre natural area located in Grundy County. In 1935, it was donated to the state by the town of Tracy City to accommodate a Civilian Conservation Corps (CCC) camp. The CCC built the picnic shelter here in the 1930's. The state originally managed the site as Grundy State Forest. The management responsibility was transferred from the Division of Forestry to the Division of Parks and Recreation in 1978. It eventually became part of the South Cumberland Recreation Area. The natural area serves as the northern trailhead of the Fiery Gizzard Trail that connects with the TVA Foster Falls Small Wild Area at the southern trailhead 12 miles away.

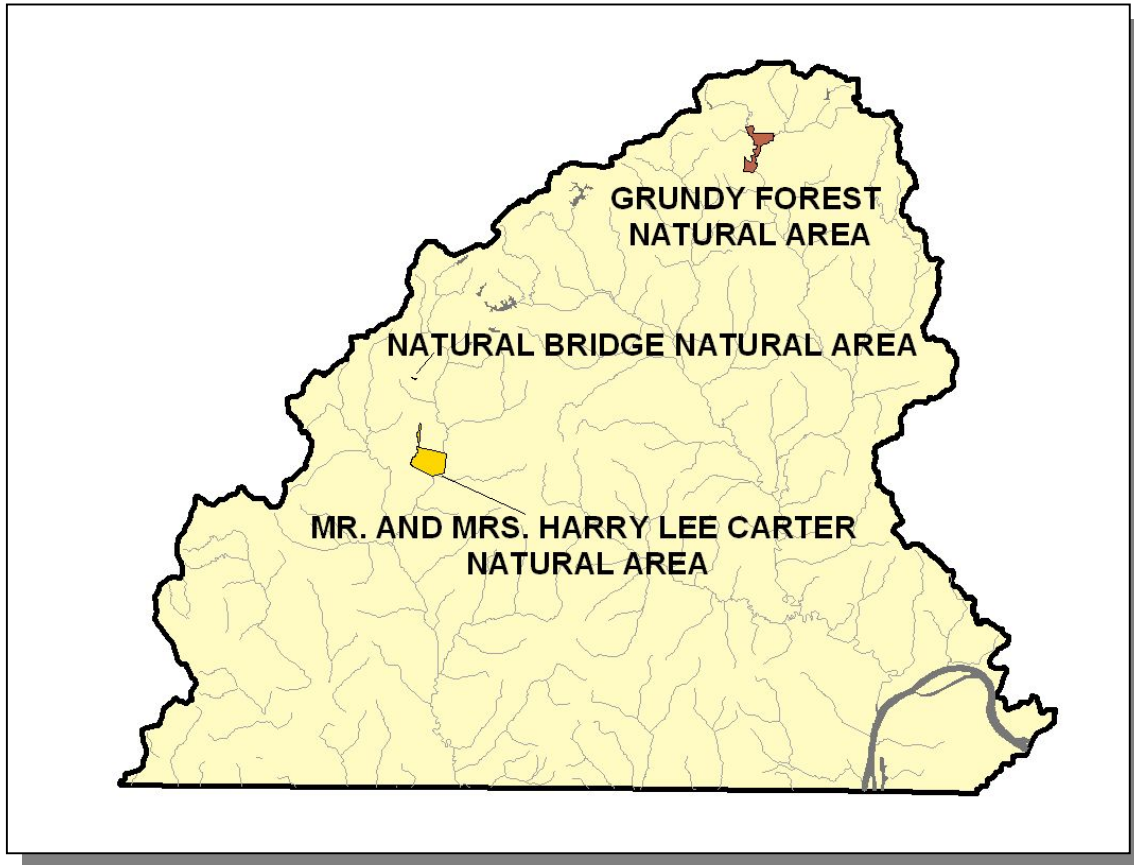


Figure 2-12. There are three Designated State Natural Areas in the Tennessee Portion of the Guntersville Lake Watershed.

2.6.B. Rare Plants and Animals. The Natural Heritage Inventory Program in the TDEC Division of Natural Areas maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Crustaceans	1
Insects	1
Mussels	1
Snails	6
Other	1
Amphibians	4
Birds	3
Fish	0
Mammals	6
Reptiles	1
Plants	44
Total	68

Table 2-3. There are 68 Known Rare Plant and Animal Species in the Tennessee Portion of the Guntersville Lake Watershed.

In the Guntersville Lake Watershed, there are four known rare amphibian species, one known rare crustacean species, one known rare mussel species, and six known rare snail species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Aneides aeneus</i>	Green Salamander		
<i>Hyla gratiosa</i>	Barking Treefrog		D
<i>Gyrinophilus palleucus</i>	Tennessee Cave Salamander		T
<i>Hemidactylium scutatum</i>	Four-toed Salamander		D
<i>Cambarus hamulatus</i>	Cave Crayfish	LE	E
<i>Lampsilis abrupta</i>	Pink Mucket	LE	E
<i>Zonitoides lateumbilicatus</i>	Striate Gloss		
<i>Somatogyrus aureus</i>	Golden Pebblesnail		
<i>Mesodon smithi</i>	Alabama Shagreen		
<i>Mesodon sanus</i>	Squat Globelet		
<i>Athearnia anthonyi</i>	Anthony's River Snail	LE, XN	E
<i>Anguispira picta</i>	Painted Disc	LT	E

Table 2-4. Rare Aquatic Species in the Tennessee Portion of the Guntersville Lake Watershed. Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service, LT, Listed Threatened by the U.S. Fish and Wildlife Service, and XN, listed as Experimental Populations. State Status: T, Listed Threatened by the Tennessee Wildlife Resources Agency; E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at <http://www.state.tn.us/environment/na/>.

2.6.C. Wetlands. The Division of Natural Areas maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

<http://www.state.tn.us/environment/na/wetlands/>

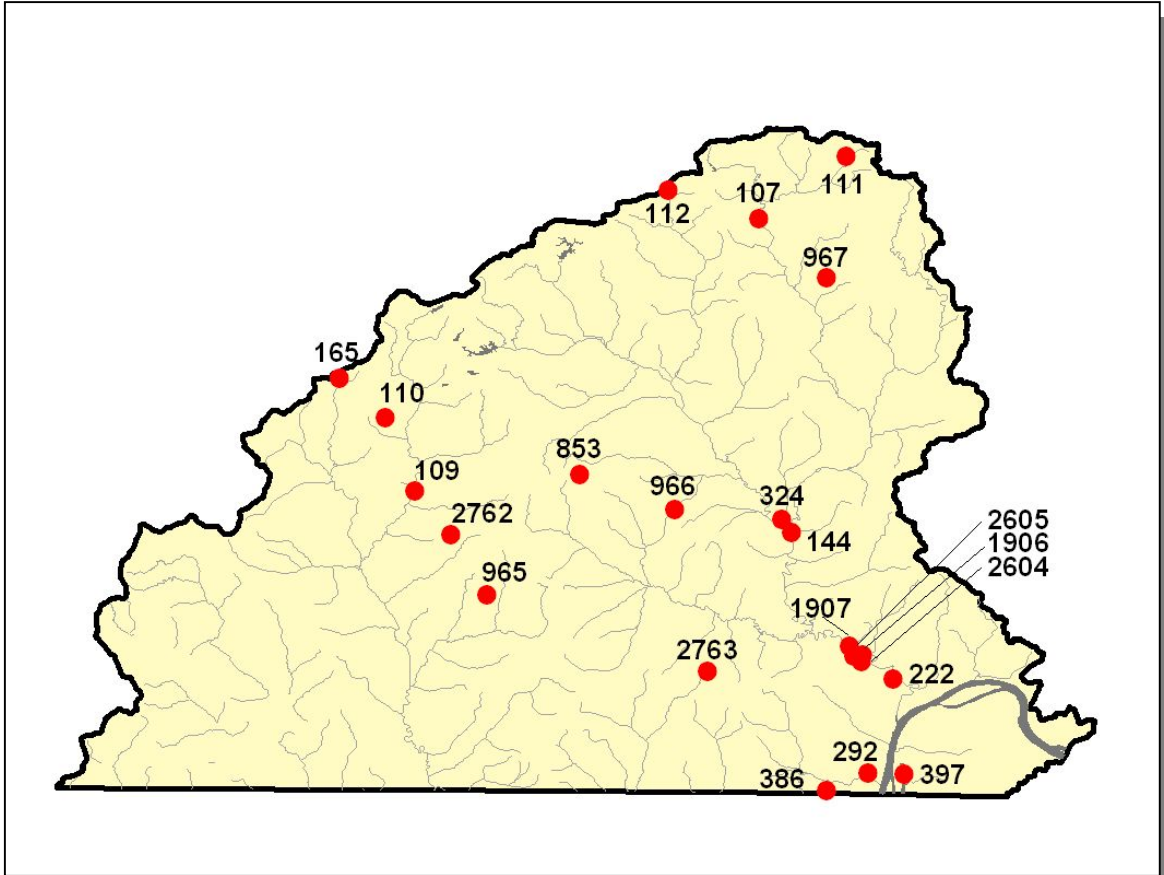


Figure 2-13. Location of Wetland Sites in TDEC Division of Natural Areas Database in the Tennessee Portion of the Guntersville Lake Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands. There may be additional wetland sites in the watershed. More information, including identification of wetland sites labeled, is provided in Appendix II.

2.7. CULTURAL RESOURCES.

2.7.A. Nationwide Rivers Inventory. The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of two streams in the Tennessee Portion of the Guntersville Lake Watershed:

Big Fiery Gizzard Creek (RM 0 to RM 17) is a densely forested stream within Tennessee Valley Authority (TVA) Foster Falls Recreation Area.

Sweden Creek (RM 0 to RM 15) is a wilderness stream affording recreational opportunities.

RIVER	SCENIC	RECREATION	GEOLOGIC	FISH	WILDLIFE	HISTORIC	CULTURAL
Big Fiery Gizzard Creek	X	X	X	X			
Sweden Creek	X	X		X	X		

Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.

Additional information may be found online at <http://www.ncrc.nps.gov/rtca/nri/>

2.7.B. Public Lands. Some sites representative of the cultural heritage are under state or federal protection:

- Grundy Lakes State Park is located inside South Cumberland State Park. This 81-acre site features the Lone Rock Coke Ovens. These ovens, operated in the late 1800s with convict labor, were used in making coke for the smelting of iron ore. More information may be found at <http://www.friendsofscsra.org/aboutthepark.htm>
- Little Gizzard Creek Small Wild Area is a 329-acre site classified as a Tennessee Valley Authority (TVA) Natural Area. More information may be found at <http://www.tva.gov/environment/land/habitat.htm>.
- University of the South is situated on a 10,000-acre campus known as "The Domain" which is located on the Cumberland Plateau in South Central

Tennessee. More information may be found at:
<http://www.sewanee.edu/biology/herbarium/virtualtour.html>

- Franklin State Forest is a 7,291-acre forest managed by the Tennessee department of Agriculture, Division of Forestry. More information may be found at: <http://tennessee.gov/agriculture/forestry/stateforests/6.html>
- Battle Creek Wildlife Management Area is a 79-acre site managed by Tennessee Wildlife Resources Agency.
- Nickajack Lake is a 10,370-acre reservoir on the Tennessee River managed by the Tennessee Valley Authority (TVA). More information may be found at: <http://www.tva.com/sites/nickajack.htm>
- Bear Hollow Wildlife Management Area is the Tennessee portion of the Nature Conservancy's Walls of Jericho purchase of 21,453-acres in Alabama and Tennessee. More information may be found at: <http://tennessee.gov/twra/reg2bearhollow.html>

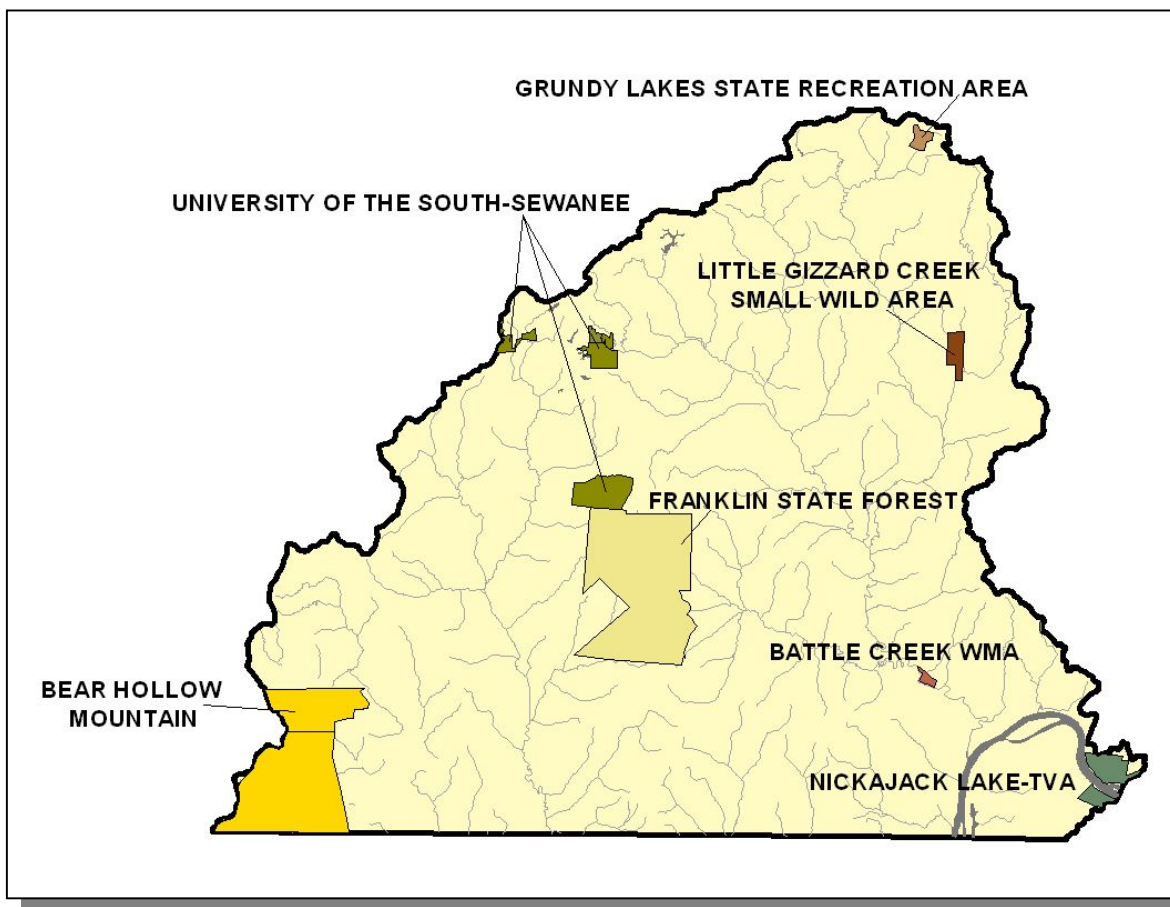


Figure 2-15. Public Lands in the Tennessee Portion of the Guntersville Lake Watershed.
 Data are from Tennessee Wildlife Resources Agency. WMA, Wildlife Management Area.

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

<http://www.state.tn.us/environment/wpc/publications/riv/>

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Battle Creek	1,2	2	1	Little Crow Creek	1		
Big Fiery Gizzard Creek	2	2	1	Little Gizzard Creek	1		
Cave Cove Branch Battle Creek	2	2		Lost Creek	1		
Cross Creek	1			Rush Creek	1		
Crow Creek	3			Sweeten Creek	2	2	1
Custard Hollow Creek	1			Talleys Fork Rush Creek	1		
Holly Flat Creek	1			West Fork Battle Creek	3	2	

Table 2-6. *Tennessee Rivers Assessment Project Stream Scoring in the Guntersville Lake Watershed.*

Categories: NSQ, Natural and Scenic Qualities
 RB, Recreational Boating
 RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
 2. Regional Significance; Good Fishery
 3. Local Significance; Fair Fishery
 4. Not a significant Resource; Not Assessed